iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 9 **Issue:** V **Month of publication:** May 2021

DOI: https://doi.org/10.22214/ijraset.2021.34658

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 9 Issue V May 2021- Available at www.ijraset.com

Breast Cancer Detection

Jain Aditi[1], Jain Anushri[2], Lashkary Riya[3]
[1, 2, 3]*Narsee Monjee Institute of Management Studies, India*

Abstract: ***Breast Cancer is a global problem currently. It is a disease which is a common cause of death for women worldwide. Earlier doctors used Mammography to find out that whether the person is suffering from it or not. But sometimes even Mammography was not able to detect whether the result is a yes or a no. for the detection of breast cancer, Machine Learning language can do wonders.***

Hence, we are making a web application which will tell whether the person is suffering from Breast Cancer in just a minute by giving the input. The input we have used is the Wisconsin Breast Cancer Dataset (WBCD). This web application will be very helpful for doctors and radiologists. Initially, we researched about Breast Cancer and its different treatments. But could not get any idea related to its detection process as any process did not surety. Hence, we came up with the Breast Cancer Detection Web Application.

Keywords: ***Breast Cancer, Machine Learning, WBCD, SVM***

I. INTRODUCTION

This chapter contains the outline of the project and its importance. The chapter also the motivation behind the selected project and the scope of this project.

The brief description of the problem faced in the current situation against the Breast Cancer. The main goal of the project is to create a web application that can help doctors to detect Breast Cancer.

II. TECHNIQUES

Machine Learning Algorithms have proved themselves to be very efficient and effective for Breast Cancer Detection. Taking this into account, we have studied different machine learning algorithms such as Logistic Regression, (KNN), Naive Bayes, Random Forest, Support Vector Machine (SVM) and Decision Tree. Later, compared them and found the best accuracy algorithm.

III. LITERATURE REVIEW

1) In paper [1], the performance of different machine learning algorithms such as Support Vector Machine (SVM) and Relevance Vector Machine (RVM) are assessed.

2) Paper [2] basically on breast cancer detection using different machine learning classifiers, as well the used in these techniques.

3) In paper [3], it is shown that the accurate classification of screening mammograms can be achieved with a deep learning model trained in an end-to-end fashion that relies on clinical ROI annotations only in the initial stage.

4) Paper [4] has used machine learning Technique which has been helpful in diagnosing cancer.

5) From paper [5], it is clearly shown that both supervised and unsupervised DL methods are used by the image analysis community, but most of the work uses the semi supervised approach.

6) In paper [6], we ran a simulation in which the AI system participated in the double-reading process that is used in the UK and found that the AI system maintained non-inferior performance.

7) In paper [7], WBCD was using 8 different Learning Algorithms and results were predicted.

8) In paper [8], attempts to solve the problem of automatic detection of breast cancer using a machine learning algorithm are summarized.

9) Paper [9] has the current in breast cancer screening and early detection. They have also highlighted some emerging technologies that may augment or replace the current modalities.

10) Paper [10], summarizes about Machine learning frequently used in medical applications such as detection of the type of cancerous cells. In this paper, Support Vector Machine (SVM) on the Wisconsin Breast Cancer is used. The is also trained with the other algorithms: KNN, Naive Bayes and CART and the accuracy of prediction for each algorithm is compared.

IV. RESULTS AND ANALYSIS

In summary, SVM was able to show its power in terms of effectiveness and efficiency based on accuracy and recall. After creating the predicted model, we can now results obtained in evaluating efficiency of our algorithms. From these results, we can understand why SVM has outperformed other classifiers. So, to conclude, we have for different machine learning algorithms and found out that Support Vector Machine has the maximum accuracy of 96.4% which is greater than the rest algorithms. So, SVM is the best method (most effective and accurate) to detect the breast cancer. The result of cross validation of each model is compared against training and testing set. Taking confusion matrix into consideration and the accuracies, it is observed that SVM is comparatively more accurate than Logistic Regression, KNN, Naïve Bayes, Random Forest, and Decision Tree in detecting breast cancer. We have also created web application taking input as the Wisconsin Breast Cancer Dataset and the results are coming out to be correct.

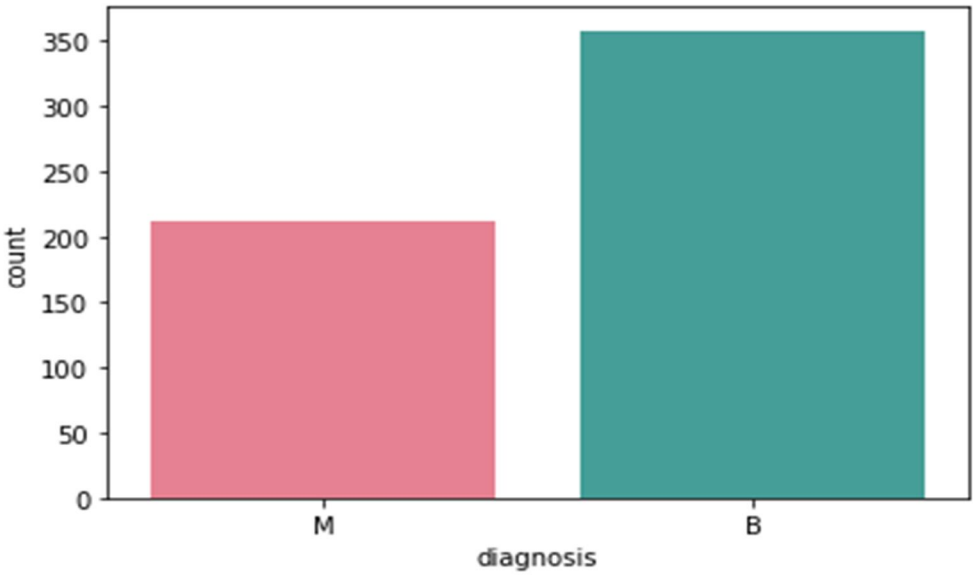


Fig: Plot Diagnosis

Algorithms	% Accuracy
Logistic Regression	95.90%
Decision Tree	88.88%
Random Forest	92.98%
Support Vector Machine	96.40%
Naïve Bayes	93.45%
KNN	95.02%

Table: Machine Learning Classifier Accuracy

V. CONCLUSION AND FUTURE SCOPE

This report elaborates in detail the need for an application which will detect Breast Cancer. By just entering the data into the web application it will be confirmed whether the person is suffering from Breast Cancer or not. Our application will be very helpful to the doctors and the hospitals. They can get its assistance for the confirmation of the disease. There is a very high need for this type of application in the market since the modality rate is increasing day by day. For future, we will try to do tie-ups with hospitals and research centres. We are mainly focusing on government hospital tie-ups. Later, we are also in the zone of giving subscription and licence of the application to the hospitals. Thus, this kind of application will turn out be a feasible solution in the detection of Breast Cancer. Our application only detects Breast Cancer. Hence, in the future we are planning to make such applications which may detect multiple diseases.

REFERENCES

[1] Gayathri, B., Sumathi, C., Santhanam, T., & Vaishnav, D. (2013). BREAST CANCER DIAGNOSIS USING MACHINE LEARNING ALGORITHMS -A SURVEY. International Journal of Distributed and Parallel systems, 4, 105-112.

[2] Mohammed, Siham & Darrab, Sadeq & Noaman, Salah & Saake, Gunter. (2020). Analysis of Breast Cancer Detection Using Different Machine Learning Techniques. 10.1007/978-981-15-7205-0_10.

[3] Shen, L., Margolies, L.R., Rothstein, J.H. et al. Deep Learning to Improve Breast Cancer Detection on Screening Mammography. Sci Rep 9, 12495 (2019). https://doi.org/10.1038/s41598-019-489954

[4] Rathi, Megha. (2012). Breast Cancer Prediction using Naïve Bayes Classifier. 1. 77-80.

[5] Gardezi SJS, Elazab A, Lei B, Wang T. Breast Cancer Detection and Diagnosis Using Mammographic Data: Systematic Review. J Med Internet Res. 2019;21(7):e14464. Published 2019 Jul 26. doi:10.2196/14464

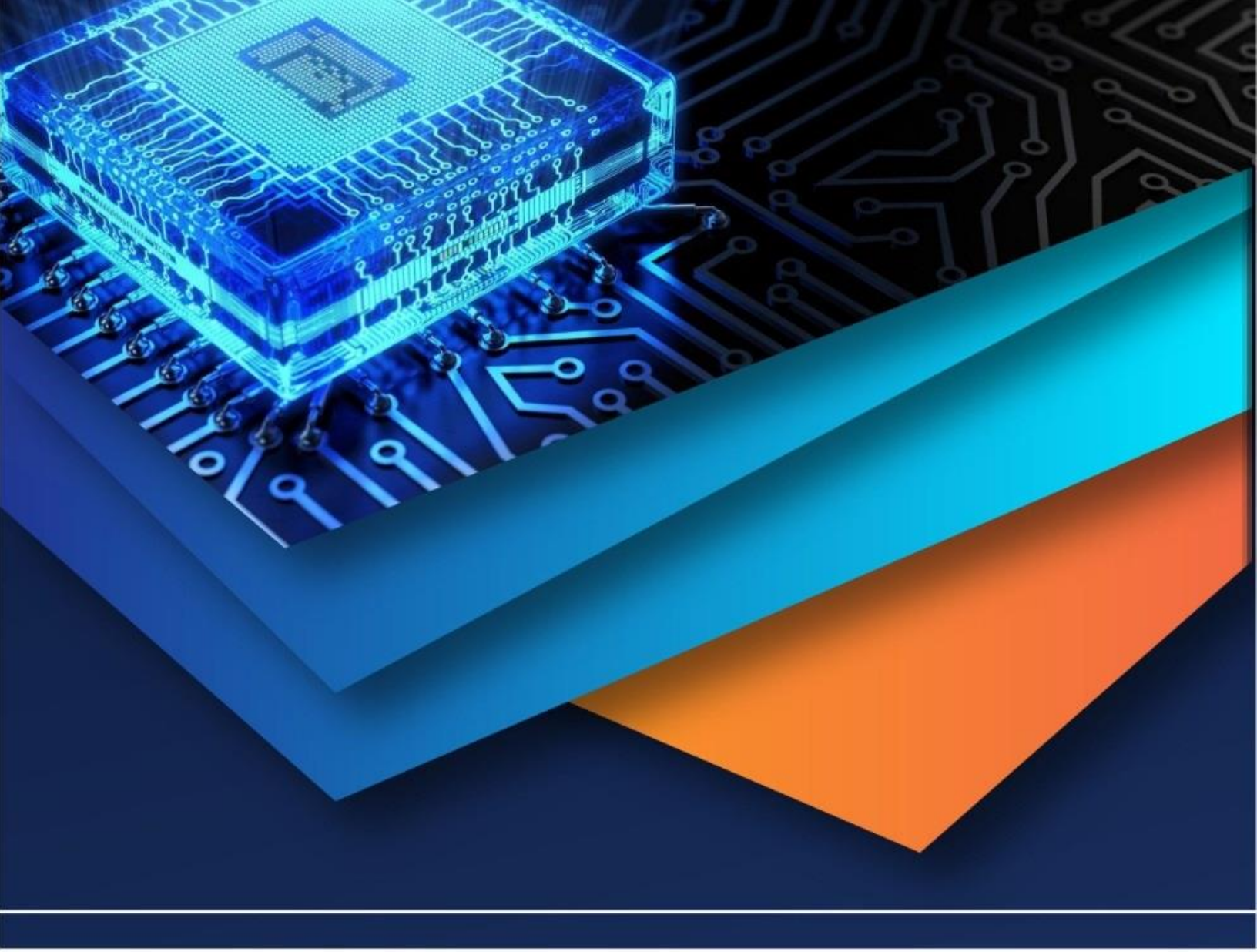
[6] McKinney, S.M., Sieniek, M., Godbole, V. et al. International evaluation of an AI system for breast cancer screening. Nature 577, 89–94 (2020).https://doi.org/10.1038/s41586-019-1799-6.

[7] Assiri, A.S.; Nazir, S.; Velastin, S.A. Breast Tumor Classification Using an Ensemble Machine Learning Method. J. Imaging 2020, 6, 39.

[8] Tang, Jinshan,Dhahri, Habib,Al Maghayreh, Eslam,Mahmood, Awais,Elkilani, Wail, Faisal Nagi, Mohammed. (2019) Automated Breast Cancer Diagnosis Based on Machine Learning Algorithms. Journal of Healthcare Engineering.

[9] Azhari, Haim, Nover, Adam B., Jagtap, Shami, Anjum, Waqas, Yegingil, Hakki, Shih, Wan Y., Shih, Wei-HengBrooks, Ari D. (2009) Modern Breast Cancer Detection: A Technological Review, 902326, 2009.

[10] Bharat, N. Pooja and R. A. Reddy, "Using Machine Learning algorithms for breast cancer risk prediction and diagnosis," 2018 3rd International Conference on Circuits, Control, Communication and Computing (I4C), Bangalore, India, 2018, pp. 1-4, doi: 10.1109/CIMCA.2018.8739696.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY